Orthogonal Defect Classification Product Description

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What is it? Orthogonal Defect Classification (ODC) is a defect-analysis technology, originally developed at IBM. This defect analysis method both supports measurement of defects and indicates defect prevention strategies for areas of concern.

Features: ODC provides identification of defect activities (when the defect surfaced), triggers (the environment or condition that had to exist for the defect to appear), targets (the high-level entity that was fixed), and types (the actual correction made).

Benefits: ODC can provide a sound, quantitative foundation to enable improvements. Analysis of defects is an important means of improving the quality of current and future software. Many organizations use Orthogonal Defect Classification to identify unexpected patterns in defect data without incurring excessive, additional cost.

Successes: (1) Analyzed ~200 critical, post-launch software problem reports on space-craft and found some unexpected defect patterns, e.g., software requirements changes in response to failed or degraded hardware, or operational anomalies. (2) Analyzed ~800 testing problem reports from Mars Exploration Rover and identified four mechanisms by which requirements changes and requirements changes occur and are resolved during testing and operations. (3) Analyzed contractor software problem reports from development and testing, and identified similarities/differences with in-house development, suggesting some changes to process. (Details are in Final Report, 12/03, to IV&V Facility.). (4) ODC picked up by several small JPL projects. (5) In 2004 a JPL project, supported in part by Research Infusion, analyzed 167 defect reports for reused software with ODC. (6) Presentation at JSC 4/04; they're looking for funding to use to improve defect metrics on Human Flight missions.

Contexts in which it is best used: ODC is best used by teams who want to incorporate improved defect metrics into their development or maintenance process. It "looks at the forest, not the trees" so provides high-level browsable graphs that the projects can use to identify defect patterns of concern. Defect patterns can then be further investigated by the projects (using, e.g., root-cause analysis on these subsets of defects) for improved understanding.

What will a successful collaboration look like?

What will the technology provider do? We will support projects in uptake of ODC technology. This support may take the form of providing previous reports and presentations for training purposes, consulting on customization of classification categories for a new project, review of project's ODC results (defect patterns, defect metrics), and advice on getting started based on lessons learned from previous projects.

What should the development team do? Perform ODC on the targeted defect data; provide data and domain knowledge; identify initial defect data of interest and provide access to those databases; management review and feedback of usefulness of initial results and guidance for subsequent defect-data investigation.

How will the technology provider work together with the development team to ensure a successful collaboration? See above. Regular telecoms, email exchanges, joint review of interim results; "re-synchronizing" as project concerns evolve.